

To determine the most posterior limit of the maxillary complete denture thru the position of vibrating line in relation with the fovea palatinae in complete denture patients visiting at tertiary care center.

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Abstract:

Objective: To determine the most posterior limit of the maxillary complete denture through position of vibrating line in relation with the fovea palatinae in complete denture patients visiting at Prosthodontics department of Isra dental college, Hyderabad.

Methodology: During this cross-sectional study from June 2018 to March 2019, 155 edentulous patients of either gender, having age ranges from 40-60 years and above were included. Indelible pencil was used for marking of vibrating line location and results of vibrating line location whether it is anterior, at or posterior to fovea palatinae were recorded in written proforma when patient pronounce the word "Ah" in normal unexaggerated manner.

Results: Among 155 edentulous patients, we found vibrating line anterior to fovea palatinae in almost 53% cases followed next in frequency it was found at the fovea palatinae in 46.5% cases.

Conclusion: Fovea palatinae is best anatomical structures to help in location of vibrating line and posterior palatal seal and vibrating line in most cases is located anterior to the fovea palatinae.

Keywords: Fovea palatinae, maxillary denture, posterior palatal seal area, retention and vibrating line.

Introduction:

Loss of complete dentition is a distressing and an irretrievable condition.^{1,2} Natural dentition plays an essential role in human's positive behaviour maintenance.³ Though, most of the persons in the old age even maintain their dentition but still then substantial percentage of the peoples required artificial prosthesis for their missing teeth.⁴⁻⁷ Treatment of completely edentulous patients are very challenging job for prosthodontist. For rehabilitation of the lost natural dentition, though many new treatment choices are present, but still remains the choice of treatment is removable complete denture. Removable complete dentures prosthesis re-establishes the function, enhance aesthetics and increase self-confidence.^{1,5} Complete dentures are the prosthesis which not only replaces the lost natural dentition by artificial means but also the related oral structures.⁸ These prosthesis also harmonized with the oral and neuromuscular functions such as speaking, chewing, deglutition and smiling including the movements of tongue, lips, cheeks and floor of the mouth.^{9,10} Retention, stability and support are the essential qualities of removable complete dentures. For retention and stability purpose of removable complete prosthesis, borders of the prosthesis should be harmonized contact with surrounding tissues produces a seal

and that seal is known as peripheral seal.¹¹⁻¹⁵ Peripheral seal creates between the flanges of the complete denture prosthesis and the underlying oral mucosa which inhibits deceiving of air & fluids underneath complete prosthesis.¹⁶ Posteriorly in maxillary denture, it's very challenging to obtain this type of seal. Posterior palatal seal have very important and major role in retention of removable maxillary complete prosthesis that's why well established seal must be recorded. It also helps in gag reflex reduction, food accumulation reduction under the complete denture posteriorly and provides comfort to the patient as well.^{7, 17, 18}

Certain reliable anatomical landmarks guide the exact position of posterior limit of upper complete denture. Fovea palatinae are reliable anatomical structures which are clinically observable small depressions on either side of the palatal midline and are generally found at or close to vibrating line.¹⁹⁻²¹ Hence, position of the vibrating line is usually considered as a valuable guide for posterior limit of upper complete dentures. Vibrating line is an imaginary line which is drawn across the palate from one hamular notch to the other and mark with indelible pencil when patient say "ah" and movements begins in the soft palate.^{22,23} It is exist at the junction of movable and immovable part of soft palate. It is visually located thru phonetic method (when patient say "ah" and soft palate lifts up), palpatory method with T burnisher, nose blowing or swallowing methods.^{9, 24}

Objective:

Current study will be helpful for dentists in locating the limit of the upper removable complete dentures posteriorly with help of determining position of fovea palatinae and vibrating line.

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Methodology:

This cross-sectional study was carried out from June 2018 to March 2019 at Department of Prosthodontics, Isra Dental College, Hyderabad. During study period 155 edentulous patients of either gender, having age ranges from 40-60 years and above were recruited. Depending upon the age, patients were divided into three groups; group 1 aged 40-49 years, group 2 aged 50-59 years and group 3 aged 60 years and above. For all those included; palatal mucosa was normal, healthy and of pink colour, fovea palatinae was present and clearly visible. Patients having any pathology, inflammation of palatal mucosa, history of trauma, surgery, any acquired or congenital craniofacial defects like cleft palate, and inadequate mouth opening were excluded. Informed consent obtained after explaining the purpose of the study in mother tongue of patient. Patients were settled in straight erect position on dental unit then trained them to speak word “Ah” repeatedly in normal unexaggerated manner. After rehearsal of pronunciation of word “Ah”, teach the patients to open their mouth widely. Gauze piece used for drying of palatal mucosa so that the upward movement of soft palate may be clearly seen when patient pronounce “ah”. Once the fovea palatinae is located, both fovea palatinae and vibrating line are marked with indelible pencil. Location of vibrating line; whether anterior, posterior or at fovea palatinae, recorded in proforma. SPSS version 21 was used for analysis of data. Descriptive analysis was performed for frequency, percentages and cross tabulation was included from the data analysis.

Results:

Among 155 edentulous patients, 90 (58%) were females and 65 (42%) were males. Overall, 52 (33.5%) patients were in 40-49 years of age group, 73 (47.1%) patients were in 50-59 years of age group and 30 (19.4%) were in age group of 60 years and above as shown in table 1.

Table No 1: Frequency and percentage of the patients according to the age groups

| Age Group | Frequency | Percent |
|--------------|-----------|---------|
| 40-49 | 52 | 33.5 |
| 50-59 | 73 | 47.1 |
| 60 and above | 30 | 19.4 |
| Total | 155 | 100 |

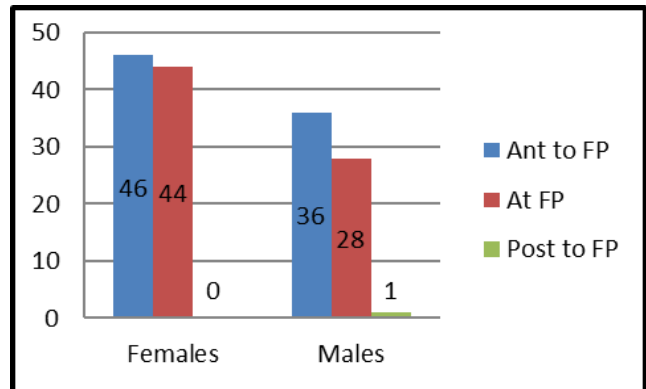
Out of 155 edentulous patients, location of vibrating line recorded anterior to the fovea palatinae in 82 (52.9%) edentulous patients, location of vibrating line recorded at the fovea palatinae in 72 (46.5%) edentulous patients and location of vibrating line recorded posterior to the fovea palatinae in only 01 (0.6%) edentulous subject (Table 2).

Table No 2: Frequency and percentage of the patients according to the location of vibrating line to the fovea palatinae.

| Location of vibrating line | Frequency | Percent |
|------------------------------|-----------|---------|
| Anterior to Fovea palatinae | 82 | 52.9 |
| At Fovea palatinae | 72 | 46.5 |
| Posterior to Fovea palatinae | 01 | 0.6 |
| Total | 155 | 100 |

From total number of edentulous patients, 46 female and 36 male subject’s vibrating line located anterior to fovea palatinae, 44 females & 28 male subject’s location of vibrating line were recorded at the fovea palatinae while only in 01 male subject had location of vibrating line was recorded posterior to the fovea palatinae as shown in fig 1.

Figure 1: Showing different position of the vibrating line in relation to gender of the patient.



Discussion:

In spite of the new treatments available such as implant dentistry, the removable complete denture prosthesis is still number 1 treatment choice. Thus, aimed at successful treatment, removable complete denture prosthesis should be functional, well retained and accepted by patient.^{25,29} Perfect posterior palatal seal is very essential for retention of complete dentures and for proper posterior palatal seal, properly locate the vibrating line. Fovea palatinae are very significant anatomical landmark for locating the vibrating line. Different methods used for locating the vibrating line but clinically “ah” method is commonly used and this method is also used in the current study.^{30,31}

Many studies showed the relationship of fovea palatinae and posterior limit of maxillary complete denture prosthesis. Some studies showed that the fovea palatinae are reliable to locate vibrating line for posterior limit of removable complete denture, while other are considered it unreliable.³²⁻³⁴ Results of current study shows that the vibrating line is located in 82 (52.9%), 72 (46.5%) and only 01 (0.6%) patients anterior, at and

posterior to the fovea palatinae respectively. Research of Alousi⁸ showed that vibrating line location was 44.5%, 50.9% and 6.4% in front, at and behind in relative to fovea palatinae respectively. Almost similar findings reported by Ahmed et al,³ that showing that the vibrating line located in front, at and behind fovea palatinae in 72(45%), 81(50.6%) and 7(4.4%) patients respectively. Another study of Lye³⁵ revealed that out of 100 patients, 92 patients had presence of fovea palatinae. His study revealed that location of vibrating line anterior, at & posterior to the fovea palatinae in 12 patients, 16 patients and 64 patients respectively. Studies of Krysinski et al and Salloum et al concluded that for determining vibrating line, fovea palatinae are the reliable anatomical landmark.^{16,36} Many studies showed that the fovea palatinae can be reliable anatomical structure which helps in locating the vibrating line and posterior palatal seal for posterior limitation of upper removable complete dentures.³⁷ Some studies showed that patients whom adequate palatal outline at hard & soft palate junction, broader will be the posterior palatal seal part.¹⁴

Study of Chen³⁷ showed that the total patients were 104. Out of them, 72 patients had clinically visible fovea palatinae. Amongst his selected patients, 75% subjects had vibrating line found anterior to the fovea palatinae, 25% subjects had at the fovea palatinae and none of the patients had posterior to the fovea palatinae. These results are consistent with findings of current study.

Conclusion:

For determining posterior limit of maxillary removable complete denture, fovea palatinae stand as a reliable anatomical landmark to guide the location of vibrating line, consequently helps in placement of posterior palatal seal and retention of upper removable complete denture prosthesis.

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